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Exploration of Level of Computer Anxiety among Veterinary Students

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An Exploration of the Level of Computer Anxiety among Veterinary Students of Punjab

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Abstract: The present study was executed to have an insight to the computer anxiety of veterinary science students (n=143) pursuing bachelor and masters' degree programmes, respectively, at Guru Angad Dev Veterinary and Animal Sciences University, Punjab (India) using a pretested and validated Computer Anxiety Rating Scale (CARS). Analysis of the data so collected revealed that irrespective of the gender, possession of personal computer and internet connection, veterinary students were well versed with computer as majority were having low level of computer anxiety. Further computer anxiety was negatively correlated with student's grade point, experience in using computer and time spent on computer and internet. The findings of present study further strengthen the pivotal role of computer in veterinary education and experience as well as in academic excellence.

Keywords: Computer anxiety, veterinary education, use of computers.

Introduction

Information Technology has influenced all the work spheres in dramatic way making it almost impossible to survive without using computer applications. The 'Digital India' initiative of the Government of India aims to increase the global competiveness of the nation, by transforming it into a digitally empowered society through extensive use of computers in various arenas (1). Midst of technological revolution, even the disciplines that were traditionally not associated with computing regime find themselves engrossed by the digitalization. Computers have been accepted unreservedly as an integral to the education system. The students of today are to apply the skills learned during academic programmes in respective fields in future. They would be required to use computer, the internet and its various services, work on the word processing, databases, spreadsheets, software, power-point slides, and so on. Since the computer technology is very dynamic and innovative, continuously witnessing advancements, mastering it and its optimum utilization to harvest the desired results by students is a tough job. Hence, despite of having basic skills and knowledge in computer, students may feel anxious while using computer to accomplish their tasks, as fluent interaction with computer interfaces requires both the basic understanding of

computer concepts as well as the basic familiarity with hardware and software. The emotional fear or apprehension of computer technology due to actual or imaginary interactions involving usage of computers is known as computer anxiety (2)(3)(4)(5). Shah et al. say that "feeling of frustration while using computers occur either when the applications are complicated or too advanced to cope with or sometimes when the system is down or malfunction" (6). But as anxiety is an emotional feeling, even a simple computer application may make a user uncomfortable if he/she is unfamiliar or less familiar with it. This anxiety is likely to influence the users' computer competence (7). Computer anxiety involves emotions and this is why it is different from negative attitudes toward computers that entail personal beliefs and feelings about computers (8). Several studies across various disciplines have been conducted to examine the computer anxiety of students. However, no known attempt has been made in India to assess the computer anxiety of students of veterinary science. Computers are useful to veterinary students for both horizontal and vertical integration of the professional curriculum facilitating the exploration of information to the depth they feel comfortable. These are utilised not only to access online journals, databases, and other information resources and for smart learning practices but could be effective in reception services, diagnostic services, clinical services, surgical management, hospital management, diagnostic imaging, etc. The significance of application of computers in veterinary education and practice makes the assessment of computer anxiety among veterinary students imperative to identify the gaps if any and suggest appropriate measures to overcome this.

Material and methods

The descriptive survey method was used to examine the computer anxiety level of veterinary students. Over the period, the educationists have developed various tools to assess the computer anxiety among stakeholders. In present study, the Computer Anxiety Rating Scale (CARS) originally developed by Heinssen et al.(5), validated by Chu and Spires (9) and used by Broome and Havelka (10) with modification to update the item description for changes in terminology was applied to examine the computer anxiety level of veterinary students. The reliability of the original Computer Anxiety Rating Scales (CARS) was acceptable with Cronbach alpha values of 0.6334 (8). Broome and Havelka (10) added one more item to the original CARS instrument containing 19-items, making it a total 20 items five-point self-rating scale to examine the computer anxiety level of the subject. The instrument contained two sections. Section-A aimed to collect the demographic information of students including gender, course of study, experience in using computer, average time spent on using computers and internet, etc. Section-B comprised of Computer Anxiety Rating Scale.

Stratified random sampling method was used to select participants for the survey. Copies of data collection instrument were distributed to 100 undergraduate and 100 postgraduate students of veterinary science pursuing bachelor and masters' degrees programmes, respectively, at College of Veterinary Science, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (Punjab), India. The CARS contained ten negative and ten positive statements. The respondents were required to give responses for each statement on CARS on five point Likert scale with respect to their level of agreement with the statements. The responses to negative statements were given scores 1 to 5 for Strongly Disagree to Strongly Agree, while positive statements were assigned reverse scores. In total 147 copies of questionnaire were received back and 4 of these were found incomplete, thus irrelevant for analyses. The consideration of only duly filled in copies of data collection instrument led to the total response rate of 71.50% comprising 76 responses of undergraduate and 67 responses of postgraduate students.

To determine the computer anxiety level of veterinary students, composite anxiety scores based on scores of individual statements were arrived. The calculated composite scores ranged from 26 to 75. The scores above 60 represent high level of computer anxiety. The data was analysed using percentage, frequencies and via Statistical Package for Social Sciences (SPSS). The t-test was applied to examine the difference in computer anxiety level of students based on their level of education, gender, availability of personal computer and internet connections. The correlation coefficient was calculated to reveal the relation between computer anxiety and other variables including academic performance of students, their experience in using computer, and time spent on usage of computer and the internet.

Results and Discussion

Demographics of respondents

The total 143 respondents comprised of 83 (58.04%) males and 60 (41.96%) females, and 76 (53.14%) undergraduate and 67 (46.86%) postgraduate students. All but 17 (11.89%) respondents had personal computers/ laptops; except 9 students, all (134) were subscribing to either mobile or broadband internet connections. The experience of students in using computers varied considerably from 2 years to 18 years consisting of 28 (19.59%) students having experience upto 5 years, 82 (57.34%) between 6-10 years, 32 (22.38%) between 11-15 years, and a student with experience of 18 years. Majority of the students, i.e.111 (77.62%) were using computers for academic purposes, 79 (55.24%) for entertainment and 31 (21.68%) for other non-academic purposes, for example to see latest news, weather, etc. About 63.63% respondents admitted that they learnt to operate computers at their own, through practice, 30.07% learnt at school level, 13.99% took help of friends to get familiar with computers and a few also attended formal training at other places. The average time spent by students on using computers and accessing the internet is tabulated below:

Table 1: Average time spent on computers and the Internet per week

Time spent on use of computer			Time spent on use of the internet		
No. of hours	No. of Students	Percentage	No. of hours	No. of Students	Percentage
1-2	61	42.65%	1-2	23	16.09%
3-4	40	27.98%	3-4	42	29.37%
5-6	42	29.37%	5-6	78	54.54%

It is evident from table 1 that majority of students (42.65%) were spending up to 2 hours per week on computer, followed by 27.98% spending 3-4 hours and 29.37% spending 5-6 hours weekly using computers. With respect to their internet usage, 54.54% students spent 5-6 hours, 29.37% spent 3-4 hours and 16.09% respondents were using the internet for up to 2 hours per week. The number of students spending 5-6 hours on internet is higher than the number of students spending equivalent time on computers. This is due to the fact that the smart phones have put information of the world in pockets of cellular data subscribers and they were using mobile phone internet more often than broadband connections on computers.

Computer Anxiety

Students' composite scores for computer anxiety varied from 26 to 75, depicting different levels of anxiety prevalence. The responses revealed that majority of students, i. e. 96.50% scored up to 60 on the CARS, representing the prevalence of no computer anxiety or low level of computer anxiety. The composite scores of remaining 03.50% students (including 3 UG and 2 PG students) were found to be higher than 60 illustrating the dominance of high level computer anxiety among them.

Statistical measure of levels of computer anxiety

An independent samples t-test was applied to statistically compare the computer anxiety level of male and female student's viz-a-viz undergraduate and postgraduate students (Table 2). The results stated no significant difference in the computer anxiety level of male and female students ($t(141)=.768$, $p(.444) > .05$) and undergraduate and postgraduate students (($t(141)=1.476$, $p(.142) > .05$).

Table 2: Gender and level of education based difference

Gender based difference						Level of education based difference					
Gender	Number	Mean	SD	t-value	*p*	Course	Number	Mean	SD	t-value	*p*
Male	83	45.2169	8.78892	.768	.444	UG	76	45.7368	8.81721	1.476	.142
Female	60	44.1000	8.27637			PG	67	43.6269	8.19245		

UG=Undergraduate, PG=Postgraduate

Further, the difference in computer anxiety level of students based on ownership of personal computers and personal internet connections was also statistically examined (Table 3).

Table 3: Personal computer and internet connectivity based difference in computer anxiety

Personal Computer Based Difference						**Personal Internet Connection Based Difference**					
Personal PC	Number	Mean	SD	t-value	*p*	Personal PC	Number	Mean	SD	t-value	*p*
Yes	126	44.4048	8.77285	1.309	.193	Yes	134	44.4851	8.58284	1.423	.157
No	17	47.2941	6.48811			No	9	48.6667	7.69740		

Comparatively, the scores of students not having personal computers and internet connectivity were observed to be higher than other students. However, statistically no significant difference was found in the computer anxiety level of students having personal computers and those not having personal computers ($t(141)=1.309$, $p(.193) > .05$) and the students having personal internet connection and those without personal internet connection ($t(141)=1.423$, $p(.157) > .05$).

Correlation of computer anxiety with academic performance and other factors

The last semester's Overall Credit Point Average (OCPA) of students was taken as measure of their academic performance. The OCPA of respondents varied from 5.8 to 8.93. The correlation coefficient was calculated to find the relation between five variables, i. e. OCPA, computer anxiety, experience in using computer, time spent on using computer and time spent on using the internet (Table 4).

Table 4: Correlation of computer anxiety with OCPA and other factors

	Computer Anxiety	Experience in computer	Time spent on computer	Time spent on Internet
Overall Credit Point Average	-.244**	.090	.319**	.003
Computer anxiety		-.233**	-.255**	-.113
Experience in using computer			.019	.023
Time spent on using computer				.323**

** Correlation is significant at the 0.01 level (2-tailed).

Correlation coefficient revealed correlations between the observed variables ranging from r=.019 for experience in using computers and time spent on computers to r=.323 for the time spent on computers and time spent on the internet. The results disclosed a negative and

significant correlation in OCPA and computer anxiety (Table 4), making it obvious that higher the academic performance, the lesser the computer anxiety. This was further supported by the significant correlation between OCPA and time spent on using computer, depicting that the higher usage of computer leads to better academic performance among veterinary students. The experience in using computer and time spent on internet had no significant correlation with OCPA. The computer anxiety had a negative and significant correlation with experience in using computer. This advocates that students with more experience in using computers feel lesser anxious about computers, whereas students with lesser experience are more anxious. The computer anxiety is further negatively and significantly correlated with time spent on computer. Students spending more time on computer have lesser anxiety. However, the computer anxiety is negatively but non-significantly correlated with time spent on using the Internet. The time spent on computers is positively and significantly correlated with time spent on the Internet at the level 0.01, making it understandable that while using computers, student access the Internet services also.

Discussion

In today's technocratic era, we cannot think of academics not having swayed by computers. Computer anxiety is a substantial barrier influencing the use of computers ultimately influencing the academic activities of students. The higher the anxiety in operating computers, the higher is the tendency of committing academic procrastination (11). On the other hand, students with better basic skills in computer technology have a positive attitude towards the use of computers for learning purposes (12). The review of literature reveals that different studies conducted on students of various academic streams have obtained different results on the variables influencing computer anxiety.

The results of present study brought forward that the anxiety scores of majority of students represented low level of computer anxiety among them. Only 03.50% students were found to have high level of computer anxiety. The students of veterinary science use computers to make assignments, notes, view technical videos on clinical practices, for diagnostic purposes and so on. Thus, the frequent use of computers and training in use of computers by either means could be attributed as the major reasons for low level of computer anxiety among students. The statistics revealed the existence of no significant difference in computer anxiety level of male and female students. Though no other study on computer anxiety among veterinary students is available for comparing the results, these results support the findings of similar studies of Olatoye (13); Havelka et al. (14); Dean (15); Onifade and Keinde (16); Adebowale (17); Han et al. (18) and Panagiotakopoulos and Koustourakis (19) conducted on students in other disciplines. Similarly, the study of Embi (20) revealed the presence of no significant mean difference between two genders with respect to computer anxiety among accounting educators at Universiti Teknologi Mara (UiTM), Malaysia. On the other hand, this finding was in contrast to the results of study by Bhaskaran and Kumar (21). They revealed the existence of a significant difference in computer anxiety between male and female students of higher secondary school in Tiruchirappalli District, India. The male were found to be more anxious.

The present study supported the findings of Panagiotakopoulos and Koustourakis (19) as the course level was found to be insignificant variable with respect to the computer anxiety level of veterinary students. Adebowale (17) disclosed that students in the vocational and commercial fields of study had better attitude towards the computer than the students of sciences and arts. Since both the undergraduate and postgraduate participants of present study were students of same discipline (veterinary science), the course level did not influence their computer anxiety level.

Panagiotakopoulos and Koustourakis (19) observed the significant differences between computer anxiety level of students who had a computer at home and those who did not. But the findings of present study were contrary to this. No significant difference was found in the computer anxiety level of students who had personal computers/ laptops and those who did not. The availability of personal internet connection also did not influence the prevalence of computer anxiety among veterinary students. Bhaskaran and Kumar (21) also produced similar results as they found that availability of personal computer at home was found to be not having any influence on the computer anxiety of students.

The results disclosed that academic performance of students had a negative and significant correlation with computer anxiety. This means that students scoring higher OCPA had lower level of computer anxiety. These findings are supportive to the study of Rahardjo et al. that the higher the GPA of students, the lower their tendency of procrastination, anxiety in operating computer, and academic stress (11). The correlation between OCPA and time spent on using computer was found to be positive and significant, making it clear that the higher usage of computer leads to better academic performance among veterinary students.

The computer anxiety was found to be negatively but significantly correlated with experience in using computer. The students with more experience in using computer were found to be less anxious about computers, whereas students with lesser experience were more anxious. This leads to the inference that students may overcome computer anxiety with experience in using computers. This finding is in line with the results of Havelka (14); Onifade and Keinde (16) who indicated that experience in using of computers significantly influences computer anxiety among students. The results of Olatoye (13) were found to be contrary to these findings as he revealed no significant relation between computer anxiety and computer utilization by students.

The computer anxiety of veterinary students was further depicted to be negatively and significantly correlated with time spent on computer. Students spending more time on computer had lower level of computer anxiety. At the same time, the computer anxiety among students was non-significantly correlated with time spent on using the internet. This could be attributed to the reason that since majority of the students have mobile internet connections, they access the internet services through mobile phones in addition to accessing the same through computers.

To summarise, the results revealed that majority of undergraduate and postgraduate students have low level and 03.50% have high level of computer anxiety, which needs attention to develop positive emotions among veterinary students to facilitate the use of information technology by all effectively.

Conclusion: Computer anxiety is the biggest barrier encumbering students in utilization of technology. Like other disciplines, veterinary science education and practice are witnessing high penetration of computers. The students who can access information, process data using computers and are able to apply technological gadgets for diagnostic purposes would have competitive advantage in national and international market. Hence, the vigorous but almost ignored issue of computer anxiety in veterinary education spheres needs attention. Introduction of mandatory course in basics of information technology and its applications in veterinary education and practice in academic programme at undergraduate level would be useful to overcome the computer anxiety and ensure effective use of computers by the students. In present study results revealed that irrespective of gender majority veterinary students of Punjab, India were well familiar with computer in general and were having low computer anxiety. Since, this study assumed to be the first on veterinary students, further replication of the study with large sample size at different location(s) may be carried out to validate the present study results as well as for comparison.

References

1. DEIT. The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. [Internet]. 2017 [cited 2017 Sep 14]. Available from: http://digitalindia.gov.in/content/about-programme

2. Owolabi, J and O.R. D. A Study of the Interaction Between Computer- Related Factors and Anxiety in a Computerized Testing Situation (A Case Study of National Open University , Nigeria). 2014;3(1):43–51.

3. Chua SL, Chen DT, Wong AFL. Computer anxiety and its correlates: a meta-analysis. Comput Human Behav. 1999;15(5):609–23.

4. Maurer MM. Computer anxiety correlates and what they tell us: A literature review. Comput Human Behav. 1994;10(3):369–76.

5. Heinssen RK, Glass CR, Knight LA. Assessing computer anxiety: Development and validation of the Computer Anxiety Rating Scale. Comput Human Behav. 1987;3(1):49–59.

6. Shah MM, Hassan R, Embi R. Computer Anxiety: Data Analysis. Procedia - Soc Behav Sci [Internet]. Elsevier B.V.; 2012;67(November 2011):275–86. Available from: http://linkinghub.elsevier.com/retrieve/pii/S1877042812053165

7. Bradley G, Russell G. Computer Experience, School Support and Computer Anxieties. Educ Psychol [Internet]. Taylor & Francis Group ; 1997 Sep [cited 2017 Sep 14];17(3):267–84. Available from: http://www.tandfonline.com/doi/abs/10.1080/0144341970170303

8. Sam HK, Othman AEA, Nordin ZS. Computer self-efficacy, computer anxiety, and attitudes toward the Internet: A study among undergraduates in Unimas. Educ Technol Soc. 2005;8(4):205–19.

9. Chu PC, Spires EE. Validating the computer anxiety rating scale: Effects of cognitive style and computers courses on computer anxiety. Comput Human Behav. 1991;7(1):7–21.

10. Broome T, Havelka D. Determinants Of Computer Anxiety In Business Students. Rev Bus Inf Syst [Internet]. 2002;6(2):9–16. Available from: http://www.journals.cluteonline.com/index.php/RBIS/article/view/4567%5Cnhttp://www.journals.cluteonline.com/index.php/RBIS/article/view/4567/4658

11. Rahardjo W, Juneman, Stianai Y. Computer Anxiety , Academic Stress , and Academic Procrastination on College Students. J Educ Learn. 2013;7(45):147–52.

12. Hong K-S, Ridzuan AA, Kuek M-K. Students' attitudes toward the use of the Internet for learning: A study at a university in Malaysia. J Educ Technol Soc [Internet]. 2003;6(2):45–49. Available from: http://www.jstor.org/stable/jeductechsoci.6.2.45%5Cnhttp://ifets.info/journals/6_2/ets-6-2.pdf#page=49

13. Olatoye RA. Influence of Computer Anxiety and Knowledge on Computer Utilization

of Senior Secondary School Students. Electron J Res Educ Psychol [Internet]. 2009;7(3):1269–88. Available from: http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ869210&site=ehost-live%5Cnhttp://www.investigacion-psicopedagogica.org/revista/new/english/ContadorArticulo.php?360

14. Havelka D, Beasley F, Broome T. A Study of Computer Anxiety Among Business Students. Am J Bus [Internet]. Emerald Group Publishing Limited; 2004 Apr 22 [cited 2017 Sep 14];19(1):63–71. Available from: http://www.emeraldinsight.com/doi/10.1108/19355181200400007

15. Dean MR. BSN students' computer anxiety prevelance and test score outcomes. Washington State University; 2004.

16. Onifade A, Keinde I. Computer anxiety among university and college students majoring in Physical and Health Education. 2013;19(June):274–86.

17. Adebowole O, Adediwura A. Correlates of Computer Attitude among Secondary School Students in Lagos State , Nigeria. Int J Comput ICT Res. 2009;3(2):20–30.

18. Han Q, Yang R, Du M. A Study of Computer Anxiety among Chinese Students Majoring in Information Technology. In: 2009 International Conference on Computational Intelligence and Software Engineering [Internet]. IEEE; 2009 [cited 2017 Sep 14]. p. 1–4. Available from: http://ieeexplore.ieee.org/document/5366804/

19. Panagiotakopoulos C, Koustourakis G. Dealing With 1st Year University Students "Computer Anxiety." Themes Educ. 2001;2(1):35–46.

20. Embi R. Computer anxiety and computer self-efficacy among accounting educators at Universiti Teknologi Mara (UiTM), Malaysia. Virginia Polytechnic Institute and State University; 2007.

21. Bhaskaran S, Kumar CA. A Study on Computer Anxiety and Their Academic Achievement among Higher Secondary School Students in Tiruchirappalli District. 2016;3(2):1–14.